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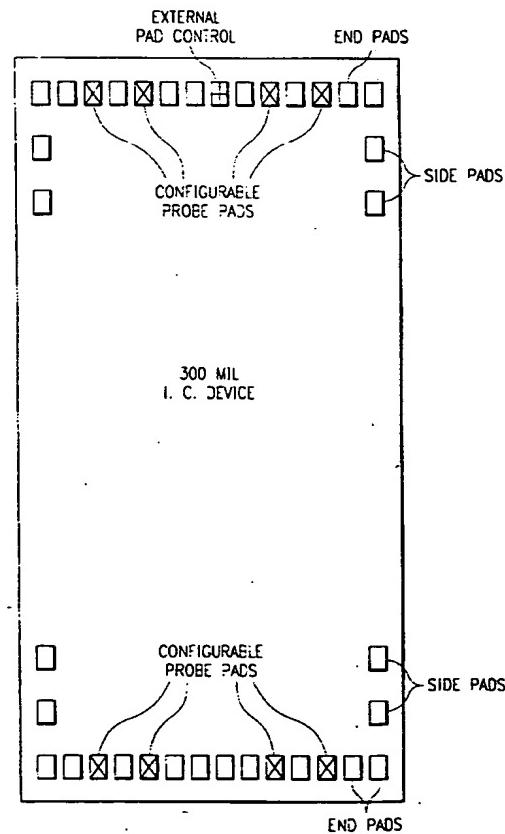
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(54) Configurable probe pads to facilitate parallel testing of integrated circuit devices.

(57) According to the present invention, parallel testing of integrated circuit devices are facilitated such that it is not necessary that integrated circuit devices to be parallel tested be "ends only" devices. A side pad located along the sides, rather than the ends, of the integrated circuit device is electrically connected by multiplexing circuitry to a corresponding configurable probe pad located along the ends of the device. During parallel testing of the device, the side pad is effectively tested when the configurable probe pad is probed and tested. While the configurable probe pad is tested during parallel testing, the side pad is not directly exercised. Following parallel testing, the side pad is bonded to the device package but the configurable probe pad is not bonded to the device package.

FIG. 2



Description

The present invention relates generally to integrated circuit device testing, and more specifically to parallel testing of integrated circuit devices.

Testing is performed throughout the manufacture and assembly of integrated circuit devices, such as at wafer sort where the speed grade of a device may be determined. Integrated circuit devices subjected to parallel testing are typically placed side by side on a wafer, and the pads of the integrated circuit devices are then probed by a tester in order to test the electrical soundness of the devices. Because the integrated circuit devices are placed side by side next to each other, parallel testing is performed on "ends only" devices or integrated circuit devices whose pads are arranged along the two opposite ends, and not along all four sides of the device. Typically, then, "ends only" integrated circuit devices can be small density parts, and are usually rectangular in shape having an aspect ratio defined as the length to width dimensions of the device. The pads of the device are arranged only along opposite ends of the device to easily allow for parallel testing of the integrated circuit device simultaneously with other identical integrated circuit devices. Parallel testing could additionally be performed on a square die device if it had very few pads which were arranged along just two opposite sides of the die.

Small density integrated circuit devices are often "ends only" devices by virtue of their relatively small die size and limited number of pads. These pads must be probed during testing of the device, and thus lend themselves to parallel testing. Parallel testing of small density integrated circuit devices may not be necessary. Because of the relative lack of complexity of such small density integrated circuit devices, testing may be accomplished in relatively short order and thus testing time does not pose a significant concern to manufacturers of these devices. Thus, although testing time of small density integrated circuit devices could be reduced by parallel testing of two or more "ends only" devices side by side simultaneously, this option may not be pursued where testing time is not a concern for small density integrated circuit devices.

As integrated circuit devices have become larger, more dense and complex, however, the issue of test time reduction has become increasingly important as the time required to test higher density devices has increased in proportion to the complexity of the device. A logical approach to address the issue of test time reduction, is to test more than one integrated circuit device at a time, i.e. to perform parallel testing of two or more integrated circuit devices simultaneously.

A recent trend in integrated circuit memory devices has been to make most memory densities available in a variety of packages, and more recently in packages that are 300 mils in width. This necessitates a bonding configuration similar to that seen for the 1 Meg SRAM

shown in Figure 1. The assembly requirements shown in Figure 1 are pertinent to any 300 mil device using similar lead frames. Additionally, other package types such as a DIP (dual in-line package) or SOJ may be used.

- 5 The assembly demands for a larger density integrated circuit device, such as a 1 Meg SRAM (Static Random Access Memory) shown in Figure 1, however, often dictate the placement of distributed pads along the long dimension of the die in order to optimize bonding to the device lead frame. Larger density integrated circuit devices, then, are typically not "ends only" devices and thus are not easily adaptable to parallel testing. The large number of pads to be tested in larger density and complex devices simply can not all be placed just along two opposite ends of the device. Thus, while large density integrated circuit devices could benefit from the reduced test time offered by parallel testing, the non-"ends only" configuration characteristic of most large density integrated circuit devices does not really allow for parallel testing.

It would be advantageous in the art to facilitate parallel testing of larger density integrated circuit devices which are not "ends only" devices, for assembly or other reasons.

- 25 Therefore, according to the present invention, parallel testing of integrated circuit devices are facilitated such that it is not necessary that integrated circuit devices to be parallel tested be "ends only" devices. A side pad located along the sides, rather than the ends, of the integrated circuit device is electrically connected by multiplexing circuitry to a corresponding configurable probe pad located along the ends of the device. During parallel testing of the device, the side pad is effectively tested when the configurable probe pad is probed and tested.
- 30 Following parallel testing, the side pad is bonded to the device package but the configurable probe pad is not bonded to the device package. A power supply such as Vcc may be applied to a second configurable probe pad to ensure that all other configurable probe pads are disconnected from their corresponding side pads during normal device operation. The method and circuitry of the present invention has no negative impact on integrated circuit device performance and additionally have no undesirable effect on area management of the device.
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According to a first aspect of the present invention, there is provided an integrated circuit device having configurable probe pads for parallel testing, comprising:

- 50 an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;
- 55 a side pad located along either the first side of the second side of the integrated circuit device;

a first configurable probe pad; a control signal that selectively disconnects the first configurable probe pad from the side pad; and means for electrically connecting the first configurable probe pad to the side pad.

The means for electrically connecting the first configurable probe pad to the side pad may be a multiplexing circuit comprising a transmission gate circuitry.

According to a second aspect of the present invention there is provided an integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;

a side pad located along either the first side or the second side of the integrated circuit device;

a configurable probe pad; and

fuse means for electrically connecting the configurable probe pad to the side pad.

The configurable probe pad may be probed during a parallel testing mode of the integrated circuit device and the side pad may not be probed during the parallel testing mode.

Following the parallel testing mode of the integrated circuit device, the side pad may be bonded to a package of the integrated circuit device and the configurable probe pad may not be bonded to the package.

According to a third aspect of the present invention there is provided an integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;

a side pad located along either the first side or the second side of the integrated circuit device;

a first configurable probe pad which is electrically connected to the side pad; and

a control signal which selectively disconnects the first configurable probe pad from the side pad.

The first configurable probe pad may be electrically connected to the side pad by a multiplexing circuit comprising a transmission gate circuitry.

According to a fourth aspect of the present invention

there is provided an integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;

a side pad located along either the first side or the second side of the integrated circuit device;

a first configurable probe pad which is electrically connected to the side pad by a multiplexing circuit; and

a control signal which selectively disconnects the first configurable probe pad from the side pad.

The control signal may be supplied to a second configurable probe pad.

The second configurable probe pad may be bonded to a supply voltage of the integrated circuit device.

The first configurable probe pad may be probed during a parallel testing mode of the integrated circuit device and the side pad may not be probed during the parallel testing mode.

Following the parallel testing mode of the integrated circuit device, the side pad may be bonded to a package of the integrated circuit device and the first configurable probe pad may not be bonded to the package.

The integrated circuit device may have an aspect ratio at least greater than 1:1 such that the length dimension of the integrated circuit device may greater than the width dimension.

The integrated circuit device may be a non-“ends only” device.

The control signal may disconnect the first configurable probe pad from the side pad after parallel testing of the integrated circuit device to ensure that the first configurable probe pad may be disconnected during a normal operating mode of the integrated circuit device.

The multiplexing circuit may comprise a transmission gate circuitry.

The multiplexing circuit may comprise a fuse circuitry.

According to a fifth aspect of the present invention there is provided a method for testing an integrated circuit device, comprising the steps of:

electrically connecting a first configurable probe pad to a side pad to be tested, wherein the first configurable probe pad is located along either a first end or a second end of an integrated circuit device and the side pad is located along either a first side or a second side of the integrated circuit device, the integrated circuit device having a length dimension and a width dimension, wherein the first side and

the second side of the integrated circuit device each have a length equal to the length dimension and the first end and the second end of the integrated circuit device each have a length equal to the width dimension;

probing the first configurable probe pad of the integrated circuit device in order to test the side pad of the integrated circuit device; and

selectively disconnecting the first configurable probe pad from the side pad.

The step of selectively disconnecting the first configurable probe pad from the side pad may be controlled by a control signal.

When the control signal is equal to a first predetermined logic state, the integrated circuit device may enter a parallel testing mode.

When the control signal is equal to a second predetermined logic state, the integrated circuit device may operate in a normal mode.

The control signal may be supplied to a second configurable probe pad.

The second configurable probe pad may be bonded to a supply voltage of the integrated circuit device.

The step of probing the first configurable probe pad in order to test the side pad of the integrated circuit device may be performed during a parallel testing mode of the integrated circuit device.

The side pad may not be probed during the parallel testing mode.

The step of electrically connecting the first configurable probe pad to the side pad may be accomplished by a multiplexing circuit.

The multiplexing circuit may comprise a transmission gate circuitry.

Applying the predetermined logic level signal to the second configurable probe pad of the integrated circuit device may be accomplished by applying a power supply signal to the second configurable probe pad of the integrated circuit device.

Probing the first configurable probe pad of the integrated circuit device in order to test the side pad of the integrated circuit device may be performed by a tester.

According to a sixth aspect of the present invention there is provided a method for testing an integrated circuit device, comprising the steps of:

electrically connecting a first pad to a second pad to be tested, wherein the first pad is located along either a first end or a second end of an integrated circuit device and the second pad is located along either a first side or a second side of the integrated circuit device, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side of the integrated circuit device each have a length equal to the length dimension and the first end and the second end of the integrated circuit device each have a length

equal to the width dimension; and probing the first pad of the integrated circuit device in order to test the second pad of the integrated circuit device.

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The step of probing the first pad in order to test the second pad of the integrated circuit device may be performed during a parallel testing mode of the integrated circuit device.

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The second pad may not be probed during the parallel testing mode.

Following the parallel testing mode of the integrated circuit device, the second pad may be bonded to a package of the integrated circuit device and the first pad may not be bonded to the package.

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The step of electrically connecting the first pad to the second pad may be accomplished by a multiplexing circuit.

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The multiplexing circuit may comprise a transmission gate circuit.

The multiplexing circuit may comprise a fuse circuitry.

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When a fuse of the fuse circuitry is left intact the integrated circuit device may be in a parallel testing mode, and the fuse may be blown before placing the integrated circuit device in a package.

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Applying the predetermined logic level signal to the second pad of the integrated circuit device may be accomplished by applying a power supply signal to the second pad of the integrated circuit device.

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Probing the first pad of the integrated circuit device in order to test the second pad of the integrated circuit device may be performed by a tester.

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The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, and further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 is a pad diagram of a 28-pin 300 mil SOJ (Small Outline J-Lead) integrated circuit device, according to the prior art;

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Figure 2 is a pad diagram of a 28-pin 300 mil SOJ (Small Outline J-Lead) integrated circuit device, according to the present invention;

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Figure 2a is a pad diagram of a 28-pin 300 mil SOJ (Small Outline J-Lead) integrated circuit device which illustrates the connection of probe pins of a probe card to configurable probe pads, according to the present invention;

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Figure 2b 300 mil SOJ (Small Outline J-Lead) integrated circuit device which illustrates the connection of bonding wires to side pads, according to the

present invention;

Figure 3 is a schematic diagram of multiplexing circuitry of an integrated circuit device for connecting a first configurable probe pad to its corresponding pad, according to a first embodiment of the present invention;

Figure 3a is a schematic diagram of multiplexing circuitry having fuse circuitry of an integrated circuit device for connecting a first configurable probe pad to its corresponding pad, according to a second embodiment of the present invention; and

Figure 4 is a schematic diagram of multiplexing circuitry of an integrated circuit device for connecting a second configurable probe pad to its corresponding pad, according to the present invention.

The present invention facilitates parallel testing of integrated circuit devices which are not necessarily "ends only" devices, meaning that it is not necessary that all pads to be tested be "end" pads permanently located along opposite ends of the integrated circuit device. Configurable probe pads placed along two opposite ends of the device, corresponding to actual probe pads of the device which are not located along two opposite ends of the device, allow the integrated circuit device to be probed during parallel testing, such as during wafer sort, as if the integrated circuit device were actually an "ends only" device. As is well known in the art, probing means to make electrical contact with a tester. Following parallel testing of the integrated circuit device, all but at least one of the configurable probe pads are not bonded to the device package but are instead tied to a predetermined logic state to ensure that the configurable probe pads are turned off during normal device operation.

Referring to **Figure 1**, a pad diagram of a 28-pin 300 mil SOJ (Small Outline J-Lead) integrated circuit device, according to the prior art, is shown. The 28-pin 300 mil SOJ device is a rectangular device having an aspect ratio, length to width ratio, of more than 1:1, meaning that the length dimension which corresponds to the sides of the device is greater than the width dimension which corresponds to the ends of the device. The 28-pin 300 mil SOJ is just an example of an integrated circuit device which may utilize the present invention; other package types, such as SOIC (Surface Outline I.C.) and DIP (Dual In-line Package) may also utilize the present invention. In keeping with the assembly requirements of the device, the 28-pin 300 mil SOIC device is not an "ends only" device but instead has several pads located along the opposite length dimensions of the device which renders a non- "ends only" device. This device, as well as other non- "ends only" devices, do not allow for parallel testing of the device since all pads to be probed during wafer sort or some other test are not on

the two opposing ends of the device and are therefore not accessible during testing. Such a device may not be tested side by side to another identical device at probe.

5 The present invention allows a non- "ends only" integrated circuit device to be tested as if it were actually an "ends only" device. This is accomplished through the placement of additional configurable probe pads which allow pads located along the sides and not on the ends of the device, which may be referred to as "side" pads since they are located along the sides of the device, to be probed during parallel testing as if they were actually located on the ends of the device. A side pad is bonded to the package of the device during packaging and is selectively connected to a configurable probe pad which 10 is shown in **Figure 2**. In this manner, parallel testing of integrated circuit devices, especially larger density integrated circuit devices, which are not "ends only" devices may be performed. Referring to **Figure 2**, a pad diagram of a 28-pin 300 mil SOJ device, according to the present invention, is shown. The 28-pin 300 mil SOJ device has additional configurable probe pads placed along opposite ends of the device to allow for parallel testing of this device in conjunction with identical testing of other identical device types simultaneously. An additional configurable probe pad located along an end of the device is constructed in the same data layers as its corresponding side pad; a configurable probe pad may be the same size as its corresponding side pad.

15 Assembly requirements dictate distributed pads 20 along the long dimension of the die to optimize bonding for this lead frame. **Figure 2** shows the placement of additional configurable probe pads along the end or ends of the device that will only be probed and typically not bonded in the finished packaged device. The additional configurable probe pads may be placed between regular end pads, as shown in **Figure 2**, in order to minimize the amount of device space used. These additional configurable probe pads allow the device to be parallel tested as if it were really an "ends only" device. Thus devices having configurable probe pads can then be tested 25 in parallel and a significant test time reduction realized.

30 **Figure 2a** is a pad diagram of a 28-pin 300 mil SOJ (Small Outline J-Lead) integrated circuit device which illustrates the connection of probe pins of a probe card to configurable probe pads. As shown in **Figure 2a**, the present invention allows for parallel testing of any desired number of identical integrated circuit devices by allowing configurable probe pads electrically connected 35 to side pads to be probed during parallel testing. **Figure 2b** shows the connection of bonding wires to side pads, thus illustrating that side pads, but not associated configurable probe pads, are down bonded during packaging of the integrated circuit device.

40 Referring to **Figure 3**, a schematic diagram of multiplexing circuitry of an integrated circuit device for connecting a first configurable probe pad to its corresponding side pad is shown. The multiplexing circuitry 45 of **Figure 3** is useful in an integrated circuit device featuring

a power-on-reset signal (POR). Similar multiplexing circuitry may be utilized in an integrated circuit device which does not have power-on-reset; in this sense, multiplexing circuitry 10 is an example of multiplexing circuitry which could be used.

Multiplexing circuitry 10 of Figure 3 connects a configurable probe pad 12 to its corresponding side pad 36, such that pad 36 is effectively probed during parallel testing of the integrated circuit device. Pad 36 may be connected to any number of functional pin types of the device, such as an Address pin, a Chip Enable pin, a Write pin, etc. The elements of multiplexing circuitry 10 include: configurable probe pad 12, a second configurable probe pad External Pad Control 14, n-channel MOS transistors 16, 20, 32, p-channel MOS transistor 30, inverters 22, 24, 26, and 28, and resistor 34. Power on Reset (POR) signal 15 is an internally generated signal. The transistors 16, 20, 30, and 32 of multiplexing circuitry 10 are heavily guardringed and therefore physically isolated to prevent potential latch-up problems. Whether configurable probe pad 12 is connected to its corresponding pad 36 is determined by the transmission gate formed by n-channel transistor 32 and p-channel transistor 30; the transmission gate is controlled by Pad Control signal 25, a derivative signal of the POR signal 15, or External Pad Control 15. As shown in Figure 3a, multiplexing circuitry could also include fuse circuitry for connecting or disconnecting configurable probe pad 12 to pad 36. When it is desirable to disconnect configurable probe pad 12 from pad 36, such as at laser repair, the fuse may be blown.

Pad Control signal 25 is a buffered signal which is driven from the additional configurable probe pad 12 during parallel testing, but which is held low after the integrated circuit device is packaged. An integrated circuit device may have more than one configurable probe pad as shown in Figure 2 but, according to the invention, only one pad, typically connected to a power supply such as Vss, need be down bonded to the substrate in the finished, packaged device. Thus, in addition to configurable probe pad 12, there is a second configurable probe pad External Pad Control 14 which may be down bonded to the device package in order to disconnect configurable probe pad 12 from pad 36. In some instances, External Pad Control 14 may not need to be down bonded at all.

Referring to Figure 4, a Vss power supply is supplied to the second configurable probe pad, External Pad Control 14, in order to disconnect configurable probe pad 12 from pad 36; other signals such as Vcc could be supplied to External Pad Control as well. A fuse may be used in place of the transmission gate formed by transistors 30 and 32 to disconnect configurable probe pad 12 from pad 36 in order to reduce the capacitive impact of configurable probe pad 12 during normal operation of the device. Fuse circuitry, however, is a permanent solution that may not be undone.

Vss power supply or some other power supply is

supplied to External Pad Control 14 by bonding pad 14 to the appropriate power supply; External Pad Control 14 may also be appropriately controlled by external logic circuitry as well. Applying Vss to this second configura-

5 ble probe pad 14 operates to turn off all other configurable probe pads, other than External Pad Control 14, during normal operation. Conversely, applying Vcc to External Pad Control 14 turns on the transmission gate formed by transistors 30 and 32 and thus allows control 10 of pad 36 through pad 12. Thus, there is one additional bond pad but the other configurable probe pads are not bonded to the device package and are transparent to the user. As stated above, there are instances where it 15 is not necessary to down bond External Pad Control 14 at all.

In order to control the logic state present on External Pad Control 14, p-channel transistor 20 forms a latch which may be selectively used. The latch allows there to be no down bonding of External 20 Pad Control 14 when the device is not in the parallel testing mode. N-channel transistor 20 pulls down towards ground potential causing External Pad Control 14 to be latched to a low logic state. When it is desired to enter a parallel testing mode, a tester supplies a high 25 logic signal to External Pad Control 14 and the latch output at node 23 is a low logic level.

Resistor 34, if not shorted out, provides ESD (electrostatic discharge) protection for pad 36 of multiplexing circuitry 10. If there is adequate ESD protection and thus 30 no need for resistor 34, then resistor 34 may be easily shorted out. If pad 36 has adequate ESD protection, it may be sufficient to protect configurable probe pad 12 as well. As previously discussed, the transistors of multiplexing circuitry 10 of Figures 3 and 4 are heavily 35 guardringed and physically isolated to avoid potential latch-up problems.

A technique and circuitry for parallel testing of an integrated circuit device which may not necessarily be an "ends only" device has been described so that the 40 test time reduction associated with parallel testing may be realized. Using the present invention, any number of integrated circuit devices may be parallel tested, subject only to the physical constraints of the probe card which provides contact to the integrated circuit devices and the tester which performs the actual testing of the devices. The present invention also allows for ease of packaging 45 following parallel testing of a device since the pads of the device are not moved in order to permit parallel testing. The integrated circuit device to be parallel tested may be a high density memory device, such as a 1 Meg 50 SRAM device, or it may be any other integrated circuit device. The integrated circuit device to be parallel tested may produce a POR signal, but this is not required. The method and circuitry of the present invention has no 55 negative impact on integrated circuit device performance as well as not having any undesirable effect on area management of the device. Additionally, the present invention has the added advantage of allowing

the same probe card to be used for both pre-laser and post-laser testing of memory integrated circuit devices since parallel testing is controlled through External Pad Control 14.

While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.

Claims

1. An integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;
a side pad located along either the first side or the second side of the integrated circuit device; a first configurable probe pad;
a control signal that selectively disconnects the first configurable probe pad from the side pad; and

means for electrically connecting the first configurable probe pad to the side pad.

2. An integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;
a side pad located along either the first side or the second side of the integrated circuit device; a configurable probe pad; and
fuse means for electrically connecting the configurable probe pad to the side pad.

3. An integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;

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a side pad located along either the first side or the second side of the integrated circuit device; a first configurable probe pad which is electrically connected to the side pad; and
a control signal which selectively disconnects the first configurable probe pad from the side pad.

4. An integrated circuit device having configurable probe pads for parallel testing, comprising:

an integrated circuit device, with a first side, a second side, a first end, and a second end, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side each has a side length equal to the length dimension and the first end and the second end each has an end length equal to the width dimension;
a side pad located along either the first side or the second side of the integrated circuit device; a first configurable probe pad which is electrically connected to the side pad by a multiplexing circuit; and
a control signal which selectively disconnects the first configurable probe pad from the side pad.

5. The device of any one of claims 1, 3 or 4 wherein the control signal is supplied to a second configurable probe pad.

6. The device of claim 5, wherein the second configurable probe pad may be bonded to a supply voltage of the integrated circuit device.

7. The device of any one of claims 1, 3 or 4 wherein the first configurable probe pad is probed during a parallel testing mode of the integrated circuit device and the side pad is not probed during the parallel testing mode.

8. The device of claim 7 wherein following the parallel testing mode of the integrated circuit device, the side pad is bonded to a package of the integrated circuit device and the first configurable probe pad is not bonded to the package.

9. The device of any one of claims 1, 3 or 4 wherein the integrated circuit device has an aspect ratio at least greater than 1:1 such that the length dimension of the integrated circuit device is greater than the width dimension.

10. The device of any one of claims 1, 3 or 4 wherein the integrated circuit device is a non-“ends only” device.
11. The device of any one of claims 1, 3 or 4 wherein the control signal disconnects the first configurable probe pad from the side pad after parallel testing of the integrated circuit device to ensure that the first configurable probe pad is disconnected during a normal operating mode of the integrated circuit device.
12. A method for testing an integrated circuit device, comprising the steps of:
- electrically connecting a first configurable probe pad to a side pad to be tested, wherein the first configurable probe pad is located along either a first end or a second end of an integrated circuit device and the side pad is located along either a first side or a second side of the integrated circuit device, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side of the integrated circuit device each have a length equal to the length dimension and the first end and the second end of the integrated circuit device each have a length equal to the width dimension;
- probing the first configurable probe pad of the integrated circuit device in order to test the side pad of the integrated circuit device; and
- selectively disconnecting the first configurable probe pad from the side pad.
13. The method of claim 12 wherein the step of selectively disconnecting the first configurable probe pad from the side pad is controlled by a control signal.
14. The method of claim 13 wherein the control signal is equal to a first predetermined logic state, the integrated circuit device enters a parallel testing mode.
15. The method of claim 13, wherein when the control signal is equal to a second predetermined logic state, the integrated circuit device operates in a normal mode.
16. A method for testing an integrated circuit device, comprising the steps of:
- electrically connecting a first pad to a second pad to be tested, wherein the first pad is located along either a first end or a second end of an integrated circuit device and the second pad is located along either a first side or a second side of the integrated circuit device, the integrated circuit device having a length dimension and a width dimension, wherein the first side and the second side of the integrated circuit device each have a length equal to the length dimension and the first end and the second end of the integrated circuit device each have a length equal to the width dimension; and
- probing the first pad of the integrated circuit device in order to test the second pad of the integrated circuit device.
17. The method of claim 16, wherein the step of probing the first pad in order to test the second pad of the integrated circuit device is performed during a parallel testing mode of the integrated circuit device.
18. The method of claim 16, wherein applying the predetermined logic level signal to the second pad of the integrated circuit device is accomplished by applying a power supply signal to the second pad of the integrated circuit device.
19. The method of claim 16, wherein probing the first pad of the integrated circuit device in order to test the second pad of the integrated circuit device is performed by a tester.

FIG. 1
(PRIOR ART)

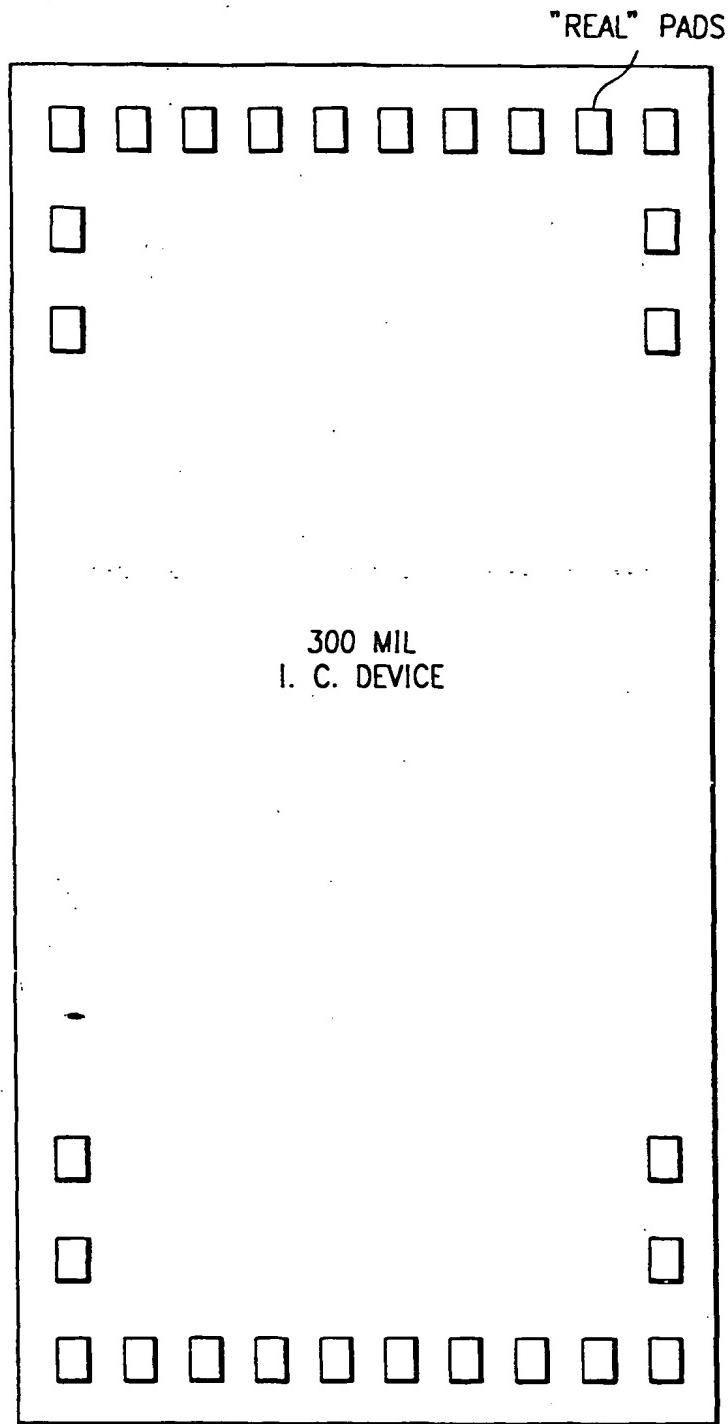
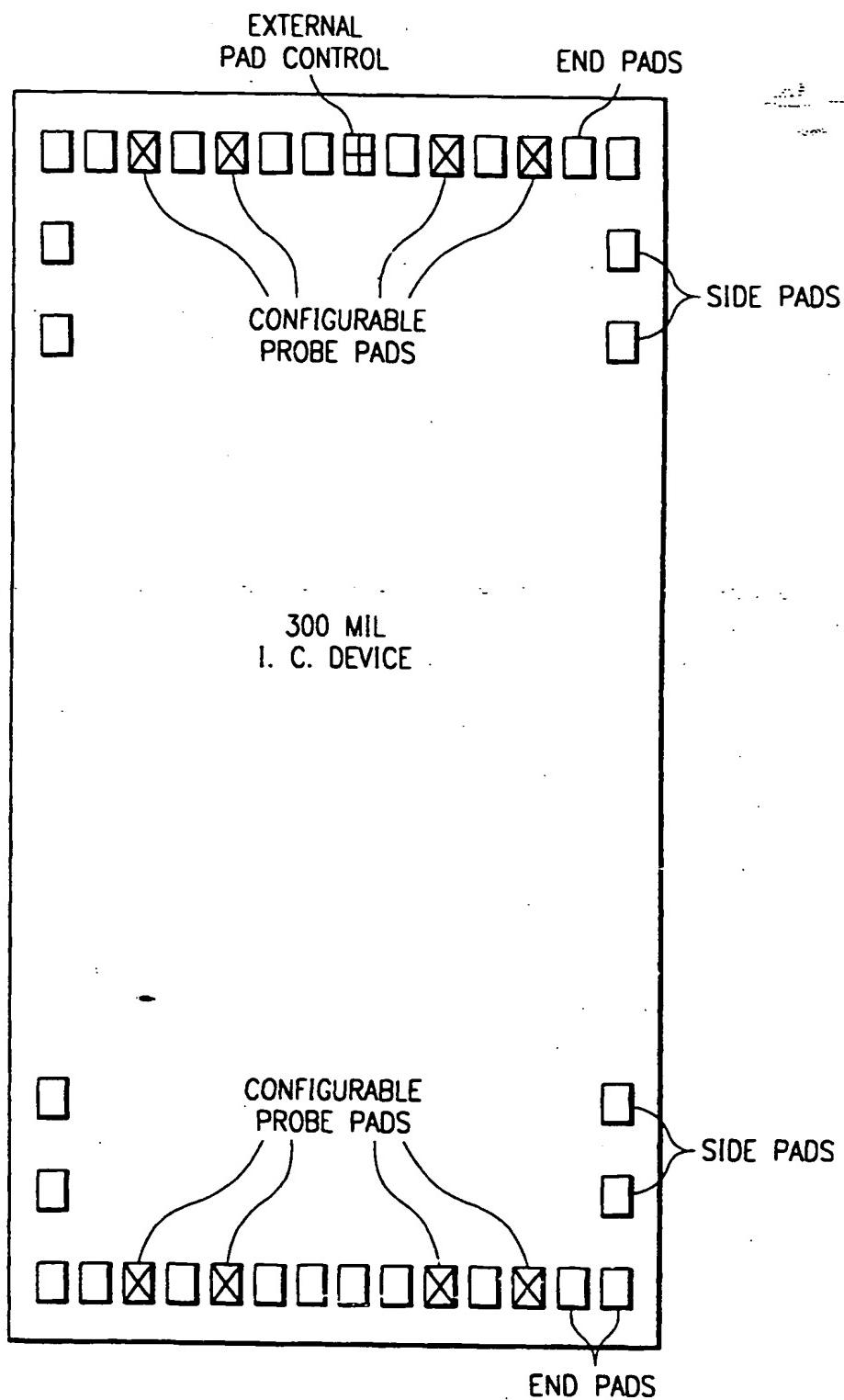


FIG. 2



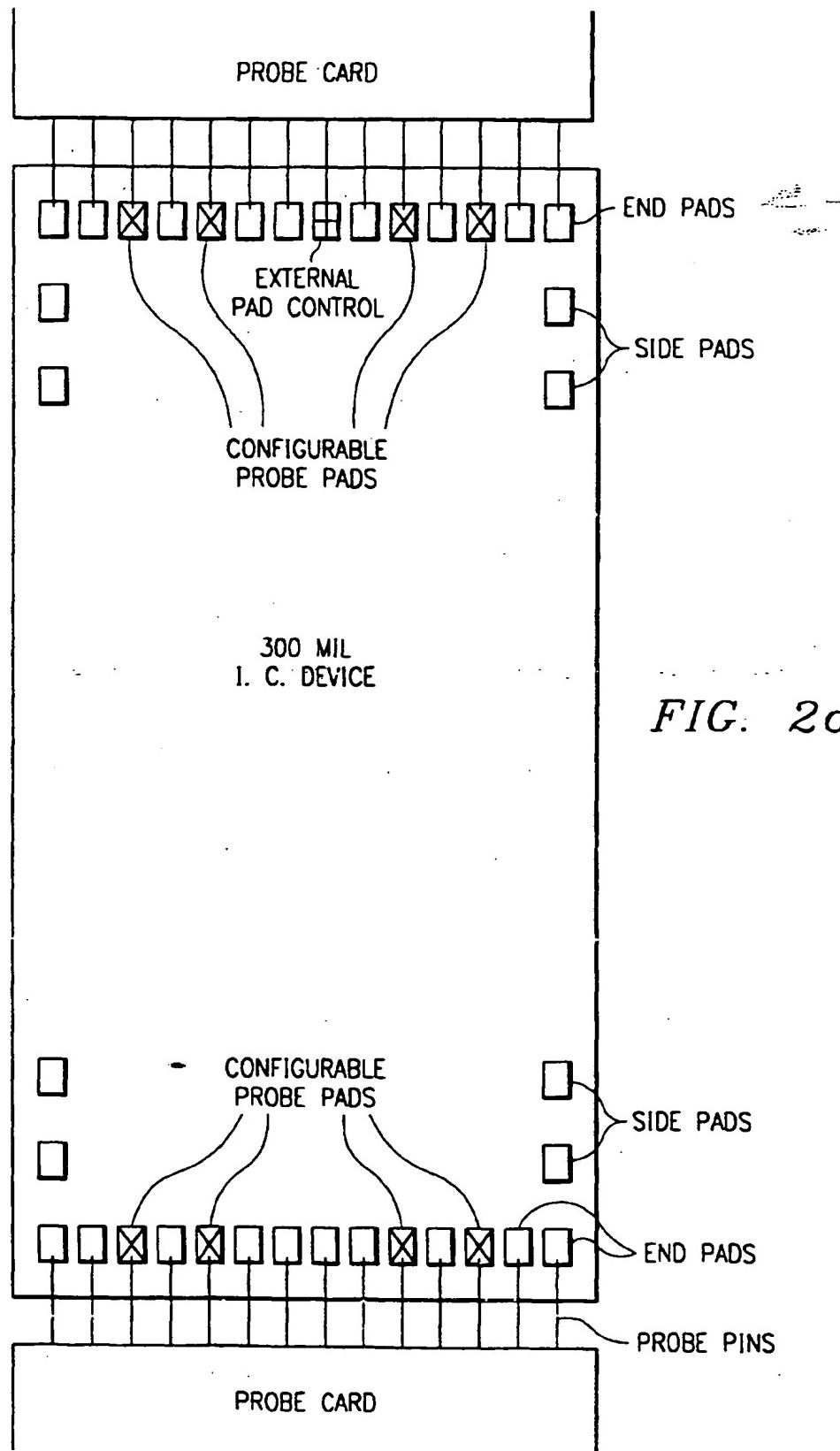


FIG. 2a

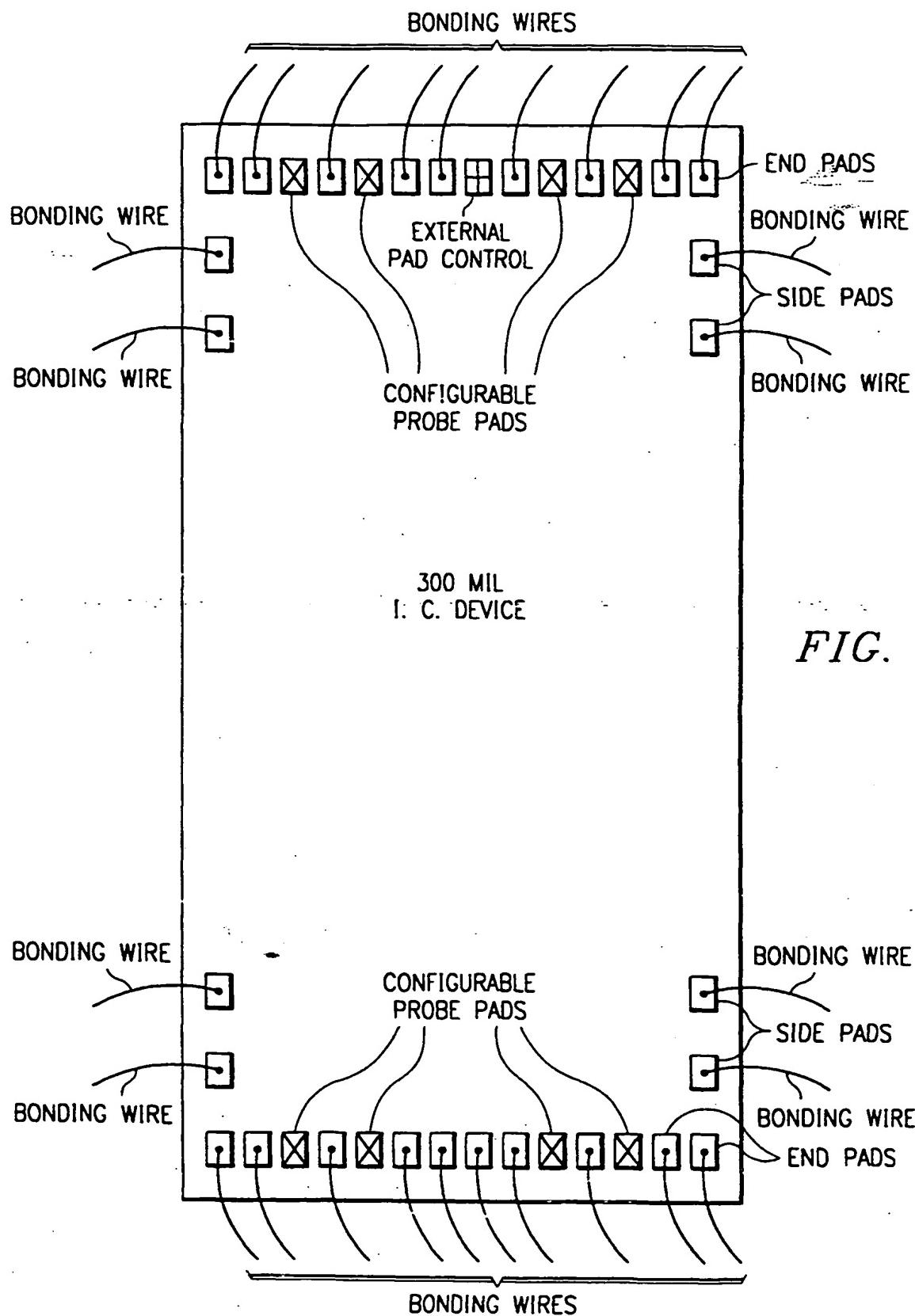


FIG. 2b

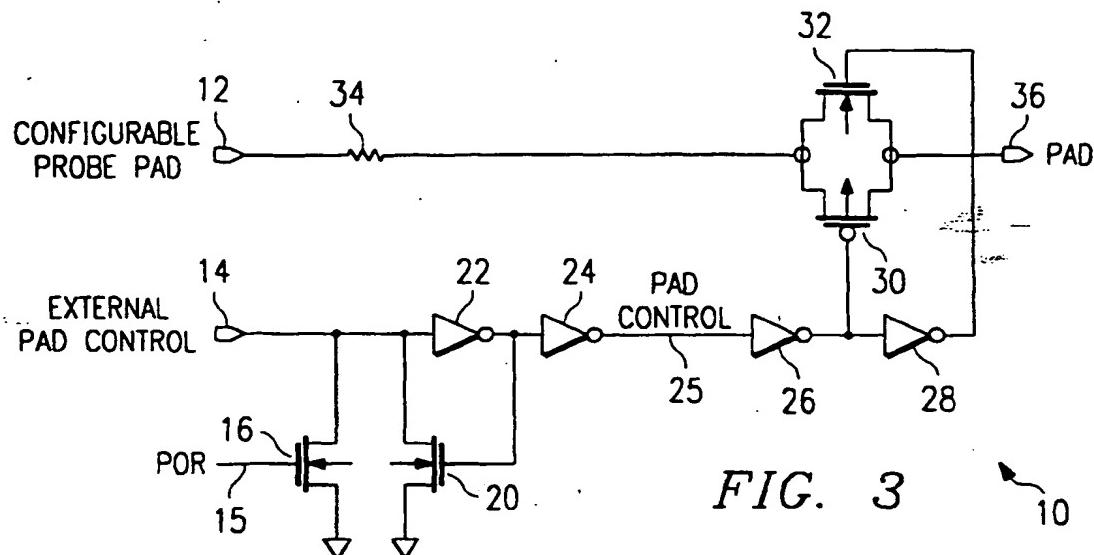


FIG. 3

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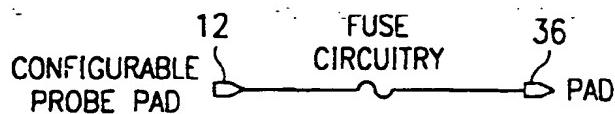


FIG. 3a

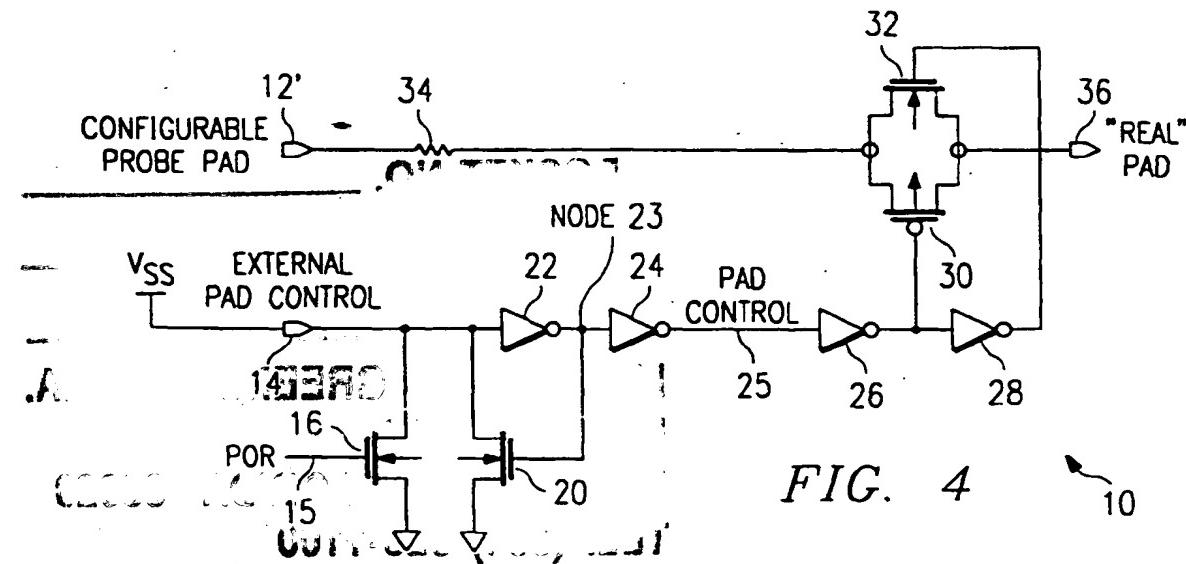


FIG. 4

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